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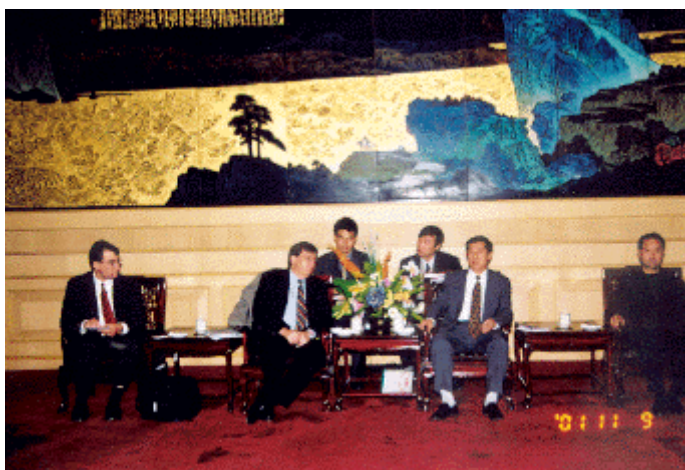
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Mr. Wang Xianzheng (Second from right), Vice Governor of Shanxi Province is meeting and discussing on CBM development in Shanxi with Mr. Edu Hassing (Second from left) and Mr. Karl Schultz (First from left). Mr. Huang Shengchu (Left in second row), Vice President of the CCII, is participating in the meeting and acting as translator.

ADB's grants and loans for CBM projects

Over the recent years, the Asian Development Bank (ADB) has been looking closely at the development of coalbed methane industry and hence actively participating in this development in China. The ADB made the decision in 1996 to provide technical assistance to China to promote coalbed methane development and utilization. At the beginning of 2001, ADB officials began to work for the CBM power generation project in Jincheng coal mining area. Having got acquainted with the relevant information about coalbed methane development and utilization in Jincheng mining area and also based on the talks with the high-level officials of Jincheng Anthracite Group, the ADB decided to include the Jincheng CBM power generation project in the ADB demonstration project to be implemented in China. Dating back to October 1996, the ADB provided US\$100,000 grant to China for the project "Survey of CBM production in China". With the assistance of China Coal Information Institute in May 1997, Mr. Edu Hassing of the ADB investigated the Yangquan CBM project and as a result this project is finally identified. In October 1998,

ADB provided a grant of US\$600,000 for the project “Yangquan CBM power generation feasibility study”, which was implemented jointly by experts from ICF and ARI of the US, EDL of Australia and local consultants from China Coalbed Methane Clearinghouse. This project was completed by the end of 2001. According to the research result, surface development bears greater risks. The research results also concluded that CBM power generation project produces remarkable environmental and economic benefits. It is also shown that CBM power generation project is endowed with stronger capability to withstand risks.

Following the tripartite meeting on ADB project in Beijing in February 2001, it was decided the Jincheng CBM power generation project is also included in the ADB project.

Accompanied by Mr Huang Shengchu, Vice

President of the CCII, Mr. Edu Hassing of the ADB, Mr. Karl Schultz of the USEPA and other ADB consultants on CBM conducted field investigation in Shanxi Province during November 9 ~ 11, 2001. Mr. Wang Xianzheng, Vice Governor of Shanxi Province and officials of Shanxi met and discussed with the ADB mission on the development and utilization of coalbed methane in Shanxi Province.

The ADB officials and project team experts came to China again at the end of January 2002 for talks with the CCII, Jincheng Anthracite Group, Yangquan Coal Group and Fushun Coal Group on CBM project loan and related issues. On this occasion, the ADB decided to provide about US\$400,000 in grant to support the project “feasibility study on Jincheng Sihe CBM power generation”. It is expected that the first batch of loans will be in place by the beginning of 2003.

2001 International CMM/CBM Investment and Technology Symposium held in Shanghai

The 2001 International CMM/CBM Investment and Technology Symposium/Exp. was successfully held in Shanghai on November 6-8, 2001, when 130 Chinese and foreign experts participated in the great event. The Symposium was co-sponsored by the State Administration of Coal Mine Safety Supervision, China National Coal Association and the United State EPA, organized by the China Coal Information Institute. The Chinese government has long been attaching great importance to coalbed methane development and hence including coalbed methane development in the energy development plan for the tenth “Five-Year-Plan” of this country. Coalbed methane thus becomes a focus attracting great attention from investors both at home and abroad. By now, eleven coalbed methane projects in international cooperation have already entered

implementation phase. The Symposium showcased the latest development and investment opportunities in CMM/CBM to domestic and international investors and developers, provided a forum for industry, governmental officials and experts to discuss the future prospects of CBM development in coal mining areas in China and exchange views on the commercialization of CBM development through international technical and economic cooperation.

Four topics are covered by this Symposium including keynote reports, coalbed methane investment opportunities, coalbed methane development technologies and coalbed methane utilization technology. A total of 30 papers were received for the Symposium.

The current status of Coalbed methane development and utilization in China in 2000

It is as early as in the 1950's that underground coalbed methane drainage was carried out in China. By the end of 2000, a national total of 184

coal mines had been equipped with underground gas drainage systems and surface transport systems. The national total coalbed methane

drainage in 2000 was recorded at 860.0 million m³, of which coalbed methane drainage in Fushun and Yangquan mining areas all exceeded 100.0 million m³, respectively. It is clear that underground gas drainage is on a constant increase in China. Technology used in China for underground gas drainage is mature and the only technical area to be enhanced is underground directional long horizontal boreholes for coalbed methane recovery. At present, the longest borehole drilled in China is only recorded at about 500m with fairly low rate of success. In some advanced countries, the longest horizontal directional boreholes reached 1500m.

In surface coalbed methane recovery, gas recovery was tested prior to coal mining operation in Fushun, Jiaozuo and some other coal mining

areas early in the 1970's. It is since the early 1990's that China began introducing CBM development technology from foreign countries. Now, coalbed methane development in China is in the phase of all-round exploration and development. By the end of 2000, a total of more than 190 surface CBM wells were completed, about 100.0 billion m³ of CBM reserves have been proved, and the highest single well CBM production reached 16000m³/d. At the present moment, the Ministry of Science and Technology is organizing some institutions to carry out key R&D projects on some key technologies for CBM development. This is done for the large-scale commercial development of coalbed methane in China.

Key R&D project on CBM exploration and development technology started

The project "selection of favorable CBM exploration areas and research on key technologies for CBM exploration and development in China" is one of the key R&D project of China for implementation during the tenth "Five-Year-Plan" period (2001 ~ 2005). Funded by the Ministry of Science and Technology (MOST), implementation of this project is to be organized and coordinated by China United CBM Co., Ltd. and implemented jointly by China Coal Research Institute (CCRI) Xi'an Branch and Chongqing Branch, China Oil Exploration and Development Institute Langfang Branch and China Coal Information Institute (CCII). Of the total investment of 20.0 million yuan, 5.0 million yuan is to be funded by the Ministry of Science and Technology and the remaining investment is to be provided by the project implementing organizations.

This project is aimed at summing up the laws of coalbed methane reservoir accumulation to provide reliable CBM reserves for the establishment of 2 ~ 3 CBM development demonstration bases in China by the end of the

CUCBM: latest status of international cooperation

Approved by the State Council and established in

2005. This project is aimed at developing the technology for sub-balance drilling and injection of CO₂ for enhanced CBM recovery. This project is also designed to develop a series of technology for both CBM surface development and commercial underground drainage, so as to provide technical support to the realization of low-cost and high-profit commercialized CBM development.

The research project includes the three sub-projects: the law of coalbed methane reservoir accumulation in China and research on economic evaluation of CBM development; research on key technologies for CBM exploration and development; research on the combination of commercial CBM development and coal mining.

China Coalbed Methane Clearinghouse is in charge of the sub-ject "Research on the economic evaluation of commercial CBM development". The project is now under way.

1996, China United Coalbed Methane Co Ltd

(CUCBM) is a state-owned specialized company dealing with coalbed methane exploration and development. CUCBM enjoys the exclusive right of carrying out international cooperation in coalbed methane exploration, development and production. Upon approval by the Ministry of Foreign Trade and Economic Cooperation (MOFTEC) in 1997, implementation of product sharing contract became the standard practice of CUCBM in international cooperation in CBM exploration and development. Generally, the product sharing contract is designed for the implementation for 30 years covering three major periods, namely exploration period, development period and production period. During exploration period, the foreign partner is to bear all the project risks and all exploration costs. In principle, participation by the Chinese side in terms of shares can be as high as 51%, while 49% for foreign partners. If the Chinese side chooses to participate at a share lower than 51%, the foreign partners may increase their shares accordingly.

CUCBM signed its first product sharing contract with Texaco China Ltd for the development of coalbed methane resources in Huaibei coal mining area in Anhui Province. Ever since that

time, CUCBM has been making headway in international cooperation. By the end of 2001, CUCBM has signed a total of 11 product sharing contracts with six foreign companies including Texaco, Phillips, Arco, Greka, Virgin of the United States and Lowell of Australia. These contracts cover a total CBM development area of about 25000km² with coalbed methane resources of about 2 trillion m³. According to these contracts, the minimum amount of committed work to be fulfilled is the drilling of 91 CBM wells, seismic survey line of 250km with a total investment of US\$41.30 million. By far, all projects are proceeding smoothly in that a total of 47 CBM wells have been drilled, of which 29 wells have been fractured. In doing so, the foreign partners have input a total of US\$76.0 million of venture capital, a total of over US\$600.0 million of foreign investment can be attracted for these projects.

CUCBM is ready to provide new blocks for international cooperation. So far, a total of 14 new blocks are ready, and negotiations are under way with some foreign companies. It is expected that CUCBM is to sign more contracts with foreign companies in 2002.

A list of international cooperation projects in China

Partner Co.	Location of project	Contract area (km²)	CBM resources (10⁸m³)
Texaco	Huaibei	2,662	600
Philips	Linxing	3,324	3,000
Arco	Sanjiao	5,215	2,940
	North of Sanjiao		
	Shilou		
Greka	Fengcheng	1,540	371
Lowell	Liulin	198	300
Texaco	Zhunge'er	6,897	10,000
	Shenfu		
	Baode		
Virgin	Hengshanbu	1,708	230

Proposal for the largest CBM power plant approved

The project proposal for the Sihe coalbed methane fired power plant with capacity of 120MW was approved by the State Development Planning Commission (SDPC) on December 24, 2001. Now, the feasibility study is under way. It is believed that Sihe CBM fired power plant is the world's largest one ever planned.

The total CBM resources within an area of 630km² in Jincheng coal mining area are as high as 104 billion m³, of which 72.8 billion m³ are recoverable. Sihe coal mine under construction is a highly gassy mine. The designed CBM drainage capacity of the underground gas drainage system is 400m³/min. The present drainage rate has reached 60m³/min of pure methane. It is expected that the annual drainage at the mine can reach 100.0 million m³ in 2003 and 162.0 million m³ in 2008. Part of CBM drained now is consumed by a small-sized power plant with a capacity of 2×2000kW and the remaining CBM drained is vented to the atmosphere. In addition, in cooperation with US-China Energy since 1997, a

total of 7 demonstration wells were drilled in Panzhuang mine with the maximum daily single well gas production reaching 10,000m³. According to a development plan, coalbed methane surface recovery from this block can be as high as 150.0 million m³/a by the year 2008.

Once this CBM fired power plant is put into operation, it will consume an annual total of 169.0 million m³ per year. The coalbed methane consumed mainly comes from the underground Sihe coal mine. The gap will be supplemented by surface recovered methane. It is estimated that the total investment on this project will be 478.96 million yuan, of which 65% (359.22 million yuan) is to be provided by preferential loans from the Asian Development Bank (ADB). This project is to be implemented in two phases. The first phase is to realize 60MW power generating capacity, which is to be commissioned by the end of 2003. The second phase is to be completed in the second half of 2008.

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